

CLAIMS

1. A replenishing and/or flushing device for a circuit including at least one hydraulic motor (16) having a casing which defines an internal space in which the cylinder block of the motor is disposed, and two main ducts (12, 14) which are connected to a main pump (10) and which constitute respectively a feed main duct and a discharge main duct for said hydraulic motor (16), the device comprising a replenishing valve (24; 224) connected to at least one of the main ducts (12, 14) and suitable for taking up an open configuration in which it establishes a link between said main duct (12, 14) to which it is connected and a pressure-free reservoir (26), and a closed configuration in which it prevents such a link from being established, the device further comprising means (46, 60, 140, 246) for causing said replenishing valve (24, 224) to go between the open and the closed configurations as a function of at least one control parameter (P) representing a state of the circuit other than pressure in said main duct (12, 14) to which said replenishing valve (24; 224) is connected;

said replenishing device being characterized in that the replenishing valve includes a moving member (64) mounted to move between a first position and a second position respectively corresponding to the closed configuration and to the open configuration of the replenishing valve, in that the device further comprises a control valve (46, 246) which is controlled as a function of said at least one control parameter to allow said moving member (64) to move, in that said device further comprises an opening control chamber (66A) suitable for being connected to one of said main ducts (12, 14) via a first link duct (142) so as to urge the moving member (64) towards its second position in which said main duct is connected to the pressure-free reservoir, and a closing control chamber (66B, 266B) suitable for being connected to a pressurized enclosure

in order to urge the moving member (64) towards its first position, and in that the control valve (46, 246) is controlled as a function of said at least one control parameter in order to connect said closing control chamber (66B, 266B) to the pressure-free reservoir or in order to isolate said chamber from said reservoir.

2. A device according to claim 1, characterized in that said control parameter (P) representing a state of the circuit is chosen from the pressure of the fluid in an auxiliary duct of the circuit, from the temperature of the fluid in a region of the circuit, from the speed of the rotor of the motor, from acceleration or deceleration of said rotor, from the active cubic capacity of the motor, from the turning angle of a vehicle driven by the hydraulic motor, from use of the flow rate delivered by an auxiliary pump for controlling auxiliary equipment, from the direction of drive of the motor, and from a braking situation.

3. A device according to claim 1 or claim 2, characterized in that it is provided with an actuator (144) suitable for controlling the control valve (46; 246) as a function of a threshold of said at least one control parameter (P).

4. A device according to claim 3, characterized in that the actuator (144) is suitable for controlling the control valve (46, 246) as a function of the temperature in a region (144') of the circuit.

5. A device according to claim 4, characterized in that it further comprises a temperature-responsive member cooperating with said actuator (144), and in that said member is situated in the vicinity of the casing.

6. A device according to any one of claims 1 to 5,
characterized in that it is provided with a replenishing
selector (20) suitable for putting the main duct (12, 14)
that is at the lower pressure into communication with the
5 replenishing valve (24; 224).

7. A device according to claim 6, characterized in that
the opening and closing control chambers (66A, 66B; 266B)
are connected to link ducts (142, 52A, 52B; 68, 76A;
10 276A) suitable for being connected via said replenishing
sector (20) to the main duct (12, 14) that is at the
lower pressure.

8. A device according to any one of claims 1 to 7,
15 characterized in that the closing control chamber (66B;
266B) is associated with replenishing resilient return
means (145; 245) continuously urging said moving member
(64) towards its first position.

20 9. A device according to any one of claims 1 to 8,
characterized in that the link duct (52B; 68) of the
closing control chamber (66B; 266B) is provided with a
constriction (54).

25 10. A device according to claim 9, characterized in that
the closing control chamber (66B; 266B) is connected to
the opening control chamber (66A) via said
constriction (54).

30 11. A device according to claim 10, characterized in that
the replenishing valve (24; 224) has a valve body (62;
262) provided with an inlet (62A) suitable for being
connected to one of the main ducts (12, 14) and with an
outlet (62B) suitable for being connected to the
35 pressure-free reservoir (26), in that the moving member
(64) is disposed in said valve body and it isolates said
inlet (62A) from said outlet (62B) in its first position,

while it connects said inlet (62A) to said outlet (62B) in its second position, and in that the opening control chamber (66A) is situated at an end (64A) of the moving member (64) that is in the vicinity of the inlet (62A) of
5 the valve body (62), while the closing control chamber (66B; 266B) is situated at the other end (64B) of said moving member (64) and communicates with the opening control chamber (66A) via a bore (68) in the moving member (64), in which bore the constriction (54) is
10 disposed.

12. A device according to claim 11, characterized in that the control valve (46; 246) has a control valve member (70; 270) that is disposed at least in part inside the
15 valve body (62; 262).

13. A device according to any one of claims 1 to 12, characterized in that the control valve (46; 246) has a control valve member (70; 270) suitable for taking up an
20 open position in which it connects the closing control chamber (66B; 266B) to the pressure-free reservoir (26) and a closed position in which it isolates said chamber (66B; 266B) from the reservoir (26).

25 14. A device according to claim 13, characterized in that it further comprises control resilient return means (55; 245) which continuously urge said control valve member (70; 270) towards its closed position.

30 15. A device according to claim 3 and to claim 13 or claim 14, characterized in that said actuator (144) is suitable for co-operating with the control valve member (70; 270) in order to urge said control valve member (70; 270) towards its open position.

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16. A device according to claim 11, and to any one of claims 3 to 5 and 11 to 15, said device being

characterized in that the actuator (144) and/or the temperature-responsive member are secured to the valve body (62; 262).

5 17. A device according to claim 16, characterized in that the actuator (144) and/or the temperature-responsive member is/are suitable for moving in the valve body (62; 262), and is/are urged continuously by resilient return means towards an abutment (72; 272) that is secured to
10 the valve body (62; 262).

18. A device according to any one of claims 1 to 17, characterized in that the control valve (46; 246) is a progressive valve.

15 19. A device according to claim 11 and to any one of claims 1 to 18, characterized in that said valve body (62; 262) is disposed in a bore in the casing.

20 20. A device according to any one of claims 1 to 19, characterized in that the replenishing valve (24; 224) has an outlet (62B) that is connected to the pressure-free reservoir (26) via the internal space inside the casing.